



EDITORIAL

Debunking myths: The utilisation of antibiotics in primary care in Spain



Desmontando mitos: el uso de antibióticos en atención primaria en España

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Do not accept what you hear by report, do not accept tradition, do not accept a statement because it is found in our books, nor because it is in accord with your belief, nor because it is the saying of your teacher. Be lamps unto yourselves. -Gautama Buddha

A graph included in a study recently published in the prestigious journal *Science* showed a country with clearly the highest utilisation of antibiotics in the world with no other competitor even closely approaching this grim privilege.¹ This article only described a small group of countries, however, we should seriously deliberate on why Spain ranks first. I have always blamed hospitals for not doing their job in this subject, but policymakers should also be blamed for not having taken the appropriate steps a long time ago. For example, where is the law enforcing pharmacies not to sell antibiotics without an official prescription? Does it make any sense that an antibiotic continues to be so cheap in our country? Let me highlight some figures taken from the 2016 Eurobarometer on antibiotic use. This phone-based questionnaire is done every three years in 28 European countries with the participation of approximately 1000 individuals from each country. On this occasion, 34% of the global population admitted having taken antibiotics in the

previous year. However, the percentage for Spain was 47%, only being surpassed by Malta with 48%. But more interestingly, according to the Spanish respondents the most frequent diagnosis for which these antibiotics were taken was influenza, followed by sore throat and common cold (17%, 16% and 15%, respectively).² In 2013, the Spanish Ministry of Health launched a National Plan on the Fight Against Drug Resistance, but no actions have been taken yet. There is only a written document. Meanwhile, multiresistant bacterial infections continue spreading in our country causing more deaths and suffering than road accidents.³ The British economist, Jim O'Neill, recently published a report entitled "Antimicrobial resistance: tackling a crisis for the health and wealth of nations". Among several stark predictions, he stated that drug resistant infections will kill an extra 10 million people a year worldwide by 2050 unless action is taken to contain antimicrobial resistance.⁴ Many general practitioners (GP) are oblivious to this global threat, therefore with this editorial I want to remind GPs that the World Health Organisation declared antibiotic resistance to be one of the three greatest threats to human health. Since primary care is apparently responsible for 80% of the antibiotics prescribed in Spain, I wouldn't be wrong in stating that we are actually one of the major culprits of this situation. When GPs are asked about how they feel about antimicrobial resistance, a common answer is 'I know it may be a problem, but this does not affect my patients'. False!

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Take the example of acute bronchitis. It is one of the most frequent infections GPs cope with and is widely treated with antibiotics in Spain, 70% of which are unnecessary.⁵ In a nice article, Macfarlane et al described how British GPs had modified their management of this illness from 1940 to 1970.⁶ Before antibiotics were available, leading medical textbooks in the 1940s characterised acute bronchitis as a bothersome, common, self-limiting illness, arising from exposure to cold or sudden changes in temperature, for which only symptomatic treatment was necessary. When penicillin became widely available in the early 1950s, antibiotics rapidly replaced symptomatic drugs as the first-choice treatment. This change, however, did not occur because of the efficacy of these drugs, but rather the treatment and prevention of complications such as pneumonia constituted the major drivers of this change as a result of the “antibiotic revolution” in the second half of the twentieth century, and this encouraged doctors to see bacteria as the primary cause of bronchitis even though no study had demonstrated this. By 1976, primary care researchers had started challenging the consensus that outcomes were improved by antibiotic therapy. Stott and West published a landmark randomised clinical trial showing that adults with acute bronchitis and productive cough did not benefit from therapy with tetracycline.⁷ The recent Cochrane systematic review backs up these results and shows that on average antibiotics reduce the duration of symptoms by less than one out of a total of 28 days.⁸ This marginal effect of antibiotics has also been observed in the common cold, acute pharyngitis, acute rhinosinusitis, and influenza. However, the legacy of the antibiotic revolution still endures, and antibiotics continue being heavily prescribed for some of these infections; why?

Apart from unrealistic misconceptions among both patients and GPs about the effectiveness of antibiotics – including demand, mostly perceived but usually not real by patients, two major reasons arise: safety and clinician’s misjudgements. A clear reason for overprescription is to avoid under-treatment.⁹ Nobody wants to be seen as having withheld treatment from a patient who subsequently deteriorates, especially if the patient winds up in hospital. However, recent research shows that serious infective complications after respiratory tract infections are rare and even GPs prescribing the least antibiotics do not seem to have to manage significantly more complications than heavy antibiotic prescribers.¹⁰ Another reason is GP’s erroneous judgement as to when to suspect bacterial infections. GPs know some predictive rules such as the Centor criteria for suspected streptococcal pharyngitis, the Anthonisen criteria for chronic bronchitis exacerbations, or the CRB-65 predictive rule for hospital admission among pneumonic patients. However, many ignore that among patients with the four Centor criteria, more than half have an infection caused by a germ other than *Streptococcus pyogenes*. Moreover, the CRB-65 is a poor predictor of hospital admission in primary care and is seldom used. Spanish GPs erroneously consider that the presence of pharyngeal exudates, purulent sputum and abnormal auscultation findings is synonymous

with bacterial infection and this is not true.¹¹ We clearly overestimate bacterial infection in these cases leading to inappropriate antibiotic prescription when it is difficult or even impossible to differentiate viral from bacterial cases in primary care unless GPs can perform rapid tests in the office.¹²

There are many misunderstandings and some myths that need to be debunked. Post-antibiotic era looms and if we wish to continue having powerful weapons against serious infections withholding unnecessary antibiotic therapy is mandatory; otherwise, like global warmth, the treatment of even mild infectious diseases is being jeopardised.

References

1. Laxminarayan R, Sridhar D, Blaser M, Wang M, Woolhouse M. Achieving global targets for antimicrobial resistance. *Science*. 2016;353:874–5.
2. European Commission. Special Eurobarometer 445, Antimicrobial Resistance; April 2016. Available at: http://ec.europa.eu/dgs/health_food-safety/amr/docs/eb445_amr_generalreport_en.pdf
3. Oteo J, Pérez-Vázquez M, Bautista V, Ortega A, Zamarrón P, Saez D, et al. Spanish Antibiotic Resistance Surveillance Program Collaborating Group. The spread of KPC-producing Enterobacteriaceae in Spain: WGS analysis of the emerging high-risk clones of *Klebsiella pneumoniae* ST11/KPC-2, ST101/KPC-2 and ST512/KPC-3. *J Antimicrob Chemother*. 2016;71:3392–9.
4. O’Neill J. Antimicrobial Resistance: tackling a crisis for the health and wealth of nations. The Review on Antimicrobial Resistance, December 2014. Available at: <https://amr-review.org/>
5. Llor C, Moragas A, Cots JM, López-Valcárcel BG, Happy Audit Study Group. Estimated saving of antibiotics in pharyngitis and lower respiratory tract infections if general practitioners used rapid tests and followed guidelines. *Aten Primaria*. 2016;16:30399–407, pii:S0212-6567.
6. Macfarlane JT, Worboys M. The changing management of acute bronchitis in Britain, 1940–1970: the impact of antibiotics. *Med Hist*. 2008;52:47–72.
7. Stott NC, West RR. Randomised controlled trial of antibiotics in patients with cough and purulent sputum. *Br Med J*. 1976;2:556–9.
8. Smith SM, Fahey T, Smucny J, Becker LA. Antibiotics for acute bronchitis. *Cochrane Database Syst Rev*. 2014;CD000245.
9. Kumar S, Little P, Britten N. Why do general practitioners prescribe antibiotics for sore throat? Grounded theory interview study. *BMJ*. 2003;326:138.
10. Gulliford MC, Moore MV, Little P, Hay AD, Fox R, Prevost AT, et al. Safety of reduced antibiotic prescribing for self-limiting respiratory tract infections in primary care: cohort study using electronic health records. *BMJ*. 2016;354:i3410.
11. Llor C, Cots JM, Bjerrum L, Cid M, Guerra G, Arranz X, et al., grupo de estudio HAPPY AUDIT España. Prescripción de antibióticos en las infecciones del tracto respiratorio y factores predictores de su utilización. *Aten Primaria*. 2010;42:28–35.
12. Hopstaken RM, Butler CC, Muris JWM, Knottnerus JA, Kester ADM, Rinkens PE, et al. Do clinical findings in lower respiratory tract infection help general practitioners prescribe antibiotics appropriately? An observational cohort study in general practice. *Fam Pract*. 2005;23:180–7.